

REMARKS/ARGUMENTS

Claims 1, 4, 7, 16-17, and 24 are amended by this response. Claims 26-33 are added. Accordingly, claims 1-33 remain pending in the instant application.

In the latest office action, the Examiner rejected the pending claims under 35 U.S.C. §101 as directed to non-statutory subject matter, and in particular to abstract and conceptual methods rather than computer-implemented methods. Accordingly, independent claims 1 and 17 have now been amended to recite computer-implemented methods, wherein metadata is stored in computer-readable storage medium, and a confounder is reported to a user interface. Support for these claim amendments may be found in the application as originally filed, at least at page 6, lines 6-8, and page 8, lines 1-2. Based upon these claim amendments, it is respectfully asserted that the claim rejections under 35 U.S.C. §101 have now been overcome.

Turning now to the claim rejections based on the prior art, embodiments in accordance with the present invention are directed to methods for analyzing data, for example as may be stored in a database. As described in the background description of the application:

Conventional techniques for analyzing such databases, however, are susceptible to errors that may be introduced by "confounders." Confounders are factors whose significance has been overlooked by the data analyst, but nevertheless influence the outcome of interest. (Emphasis added; page 1, line 25 - page 2, line 1)

A human data analyst having an in-depth understanding of a particular subject matter may be able to recognize a confounder and track down the source of error. However, human analysts lacking such knowledge may not easily recognize a confounder, and thereby reach an incorrect conclusion. (Emphasis added; page 2, lines 18-22). Embodiments in accordance with the present invention thus relate to methods and systems which:

enable researchers to form and verify their hypotheses more easily, without relying so heavily on freshly obtained experimental data to verify each hypothesis, and without relying on close cooperation with domain experts and statisticians. (Emphasis added; page 3, line 24 - page 4, line 2)

Figure 1 (reproduced below) of the instant application, illustrates a block diagram of one embodiment of a system in accordance with the present invention wherein queries are inputted to

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a query processor (13) which parses each query and submits the query to compensation/identification process "CCIP" (14):

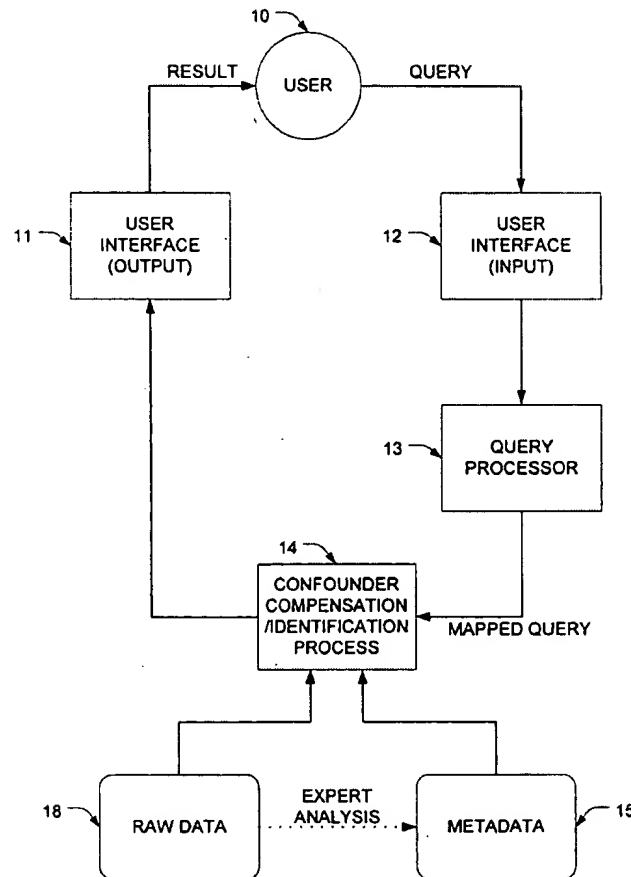


FIG. 1

The instant specification emphasizes the importance of the role played by metadata (15) in accurate analysis of the data:

metadata 15 specifies whether a relationship exists between a plurality of influencers and outcomes. Optionally, the metadata 15 may also describe a characteristic of that relationship. . . . the metadata 15 can serve as a repository for the experts' knowledge concerning the various influencers and outcomes. Consulting this repository enables data analysts to obtain the benefit of this knowledge without actually consulting a live expert. (Emphasis added; page 7, lines 13-26)

The instant specification further emphasizes the use of metadata to compensate for confounders. (Page 7, lines 5-6)

Independent claims 1, 8, and 17 have accordingly now been amended to read as follows:

1. A computer implemented method of identifying a confounder, the method comprising the steps of:

... storing metadata in a computer readable storage medium as a part of the model, the metadata specifying,

whether a relationship exists between an influencers and an outcome, and

a characteristic of that relationship, including whether the influencer represents a confounder of the outcome;

inputting to a user interface a query that specifies a set of conditions;

determining a relationship between the set of conditions specified in the query and a particular outcome that is represented in the model;

identifying, based on the metadata of the model, at least one potential influencer of the particular outcome, and whether the potential influencer represents a confounder of the particular outcome (Emphasis added)

* * *

8. A computer-implemented method of identifying relationships between influencers and outcomes under a particular set of conditions, the method comprising the steps of:

... storing metadata in a computer readable storage medium as a part of the model, the metadata specifying,

whether a relationship exists between an influencer and an outcome, and

a characteristic of that relationship, including whether the influencer represents a confounder of the outcome;

inputting to a user interface a query that specifies a set of conditions;

determining a relationship between the set of conditions specified in the query and a particular influencer that is represented in the model;

determining a relationship between the set of conditions specified in the query and a particular outcome that is represented in the model;

identifying, based on the metadata of the model, at least one potential confounder of the particular outcome, wherein the potential confounder is unaccounted for by the query (Emphasis added)

* * *

17. A computer-implemented method of identifying relationships between influencers and outcomes under a particular set of conditions, the method comprising the steps of:

... storing metadata in a computer readable storage medium as a part of the model, the metadata specifying,

whether a relationship exists between an influencers and an outcome, and

a characteristic of that relationship, including whether the influencer represents a confounder of the outcome;
inputting to a user interface a query that relates to at least one of the nodes;
determining a relationship between the query and the nodes of the model;
identifying, based on the metadata of the model, a potential influencer of an outcome associated with the query, and whether the potential influencer represents a confounder of the outcome . . . (Emphasis added)

In the latest office action, the Examiner rejected all of the pending claims as anticipated under 35 U.S.C. §102 by U.S. patent no. 6,021,403 to Horvitz et al. ("the Horvitz patent"). These claim rejections are traversed as follows.

As a threshold matter, the Examiner is reminded that the claims stand rejected as anticipated, and not merely obvious, in light of the Horvitz patent:

[t]he distinction between rejections based on 35 U.S.C. 102 and those based on 35 U.S.C. 103 should be kept in mind. Under the former, the claim is anticipated by the reference. No question of obviousness is present. In other words, for anticipation under 35 U.S.C. 102, the reference must teach every aspect of the claimed invention either explicitly or impliedly. Any feature not directly taught must be inherently present. (Emphasis added; MPEP 706.02)

Here, the Horvitz patent relied upon by the Examiner, fails to teach every aspect of the pending independent claims. Specifically, the Horvitz patent contains no teaching or even suggestion, regarding the use of metadata permitting confounder analysis. Rather, the Horvitz patent relates to constructing a reasoning model which attempts to understand the intentions of a user in order to anticipate formulation of a query. This stands in marked contrast to the claimed embodiments, which focus upon analyzing the impact of influencers on the results of a query that has already posed by a user.

In light of this failure by the art relied upon by Examiner to teach every aspect of the pending claims, it is respectfully submitted that these pending claims are patentable. Continued rejection of the claims as anticipated is improper, and these claim rejections should be withdrawn.

Finally, it is noted that the instant application is amended by this response to add new claims 27-31. New dependent claims 27-28 recite that the metadata is stored in the computer

readable storage medium comprising one of a random access memory (RAM) and a hard disk. Support for these new claims may be found in the application as originally filed at page 8, lines 1-2. New dependent claims 29-30 recite that the metadata comprises a directed graph representation. Support for these new claims may be found in the application as originally filed at page 8, lines 8-20. New dependent claims 30-31 recite that the metadata encodes at least one of expert domain information and statistical opinion information. Support for these new claims may be found in the application as originally filed at page 7, lines 16-18. New dependent claims 32-33 recite that analyzing the effect or impact of the influencer on the outcome comprises at least one of comparing distributions of probable confounders in multiple groups of conditions, employing descriptive statistics, employing graphical summaries, employing Student's t statistics, considering groups of confounders utilizing multi-way variance, and employing propensity scores. Support for these claims may be found in the application at least at page 16, line 22 - page 17, line 2. No new matter has been introduced by the addition of the claims.

In view of the foregoing, Applicants believe all claims now pending in this Application are in condition for allowance. The issuance of a formal Notice of Allowance at an early date is respectfully requested. If the Examiner believes a telephone conference would expedite prosecution of this application, please telephone the undersigned at 650-326-2400.

Respectfully submitted,



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